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File 7745

VERIFICATION OF TRANSLATION

I hereby declare and state that I am knowledgeable of each of the German and English languages and that I made and reviewed the attached translation of the International Preliminary Examination Report regarding the PCT application entitled "Microstructured Gas Sensor with Gas-Sensitive Properties Controlled by Imposition of an Electric Field" from the German language into the English language, and that I believe my attached translation to be accurate, true, and correct to the best of my knowledge and ability.

Date: September 6, 2004



Isabel A. Leonard
Translator

INTERNATIONAL PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant or Agent file number: MIC145WO	FURTHER ACTION	See notification of transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International File No: PCT/EP 03/02544	International application date: (day/month/year): 12.03.2003	Priority date (day/month/year): 12.03.2002
International Patent Classification (IPC) or national classification and IPC: G01N27/416		
Applicant MICRONAS GMBH et al.		

1. This International Preliminary Examination Report has been issued by the authority responsible for international preliminary examination and is forwarded to the applicant under Article 36.
2. This REPORT has a total of 6 pages including this cover sheet.
☐ The Examination Report also includes ATTACHMENTS; these consist of sheets with specifications, claims, and/or drawings which were amended and form the basis for this report, and/or pages with corrections made by this authority (see Rule 70.16 and Section 607 of the PCT guidelines).

These attachments comprise a total of pages.

3. This Examination Report contains information on the following points:
 - I ☒ Basis of examination report
 - II ☐ Priority
 - III ☐ No opinion issued regarding novelty, inventive step, or industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Finding, with supportive reasoning according to Rule 66.2 a)ii), regarding novelty, inventive step, and industrial applicability; documents and explanations in support of this finding
 - VI ☐ Specific documents cited
 - VII ☐ Specific flaws in international application
 - VIII ☐ Specific comments on international application

Date application filed: 16.08.2003	Issue date of this report: 19.03.2004
Name and address of authority responsible for international preliminary examination: European Patent Office D-80298 Munich Tel. +49 89 2399 – 0 Tx: 523656 epmu dl Fax: +49 89 2399 - 4465	Authorized official: E. Stussi Tel. +49 89 2399-2265 [seal]

**INTERNATIONAL PRELIMINARY EXAMINATION
REPORT**International Application Number **PCT/EP03/02544**

I. Basis of Report

1. Regarding the **components** of the international application (*replacement pages filed with the Application Office in response to a request under Article 14 are deemed "originally filed" in the context of this report and are not attached because they contain no amendments (Rules 70.16 and 70.17)*):

Specification, pages:

1-12 in the version originally filed

Claims, Nos.:

1-11 in the version originally filed

Figures, pages:

1/4-4/4 in the version originally filed

2. Regarding **language**: All the components listed above are available to the authority in the language in which the international application was filed or were filed in this language unless otherwise stated below.

The components are available to the authority in language: or were filed in this language; these are:

- ☐ the language of the translation filed for purposes of the international search (according to Rule 23.1(b));
 - ☐ the language in which the international application was published (according to Rule 48.3(b)).
 - ☐ the language of the translation filed for purposes of the international preliminary examination (according to Rule 55.2 and/or 55.3).
3. Regarding the **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was conducted on the basis of the sequence listing which:
- ☐ is contained in the international application in written form;
 - ☐ was filed together with the international application in computer-readable form;
 - ☐ was filed with the authority subsequently in written form;
 - ☐ was filed with the authority subsequently in computer-readable form;
 - ☐ the declaration that the sequence listing subsequently filed in writing does not go beyond the disclosure content of the international application, at the time it was applied for, was submitted;
 - ☐ the declaration that the information entered in computer-readable form corresponds to the written sequence listing was submitted.

4. Because of the amendments, the following documents no longer apply:

- ☐ specification, pages:
- ☐ claims, nos.:
- ☐ drawings, page:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**International Application Number **PCT/ EP03/02544**

5. ☐ This report was issued without taking into account (some of) the amendments, as these, for the reasons stated, in the opinion of the authority go beyond the content disclosed in the version originally filed (Rule 70.2 c)).

(Reference should be made in Point 1 to replacement pages containing such amendments; they should be attached to this report).

6. Any additional remarks:

V. Finding with supporting reasons according to Article 35(2) regarding novelty, inventive step, and industrial applicability; documents and explanations in support of this finding.

1. Finding

Novelty Yes: Claims 2-5,7,8,10
 No: Claims 1,6,9,11

Inventive step: Yes: Claims
 No: Claims 1-11

Industrial applicability: Yes: Claims 1-11
 No: Claims

2. Documents and explanations
see attachment

Re Point V

Reference is made to the following documents

- D1: HELLMICH W ET AL: 'Field-effect-induced gas sensitivity changes in metal oxides' SENSORS AND ACTUATORS B, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, Vol. 43, No. 1-3, September 1, 1997 (1997-09-01), pp. 132-139
- D2: STORM U ET AL: 'A resistive gas sensor with elimination and utilization of parasitic electric fields' SENSORS AND ACTUATORS B, ELSEVIER SEQUOIA S.A., LAUSANNE, CH, Vol. 77, No. 1-2, June 15, 2001 (2001-06-15), pp. 529-533, referred to in application
- D3: DE 44 42 396 A
- D4: SCHEINERT M ET AL: 'Electrically controlled metal oxide gas sensor designed with PROSA-CHEM' PROCEEDINGS OF IEEE SENSORS 2002. ORLANDO, FL, JUNE 12 - 14, 2002, IEEE INTERNATIONAL CONFERENCE ON SENSORS, NEW YORK, NY: IEEE, US, Vol. 1 of 2. CONF. 1, June 12, 2002 (2002-06-12), pp. 356-360

2. Document D1 is regarded as the prior art closest to the subject of Claim 1. It discloses (references in parentheses refer to this document):

an integrated gas sensor having a semiconductor body (p. 132, col. 2, "Experimental Details", first six lines) on which there is arranged a gas-sensitive resistor film contacted by electrodes, at least one field electrode being situated under the resistor film and isolated by an insulator film (p. 133, col. 1, second paragraph), the insulator film having a thickness that is at least approximately less than or equal to roughly 10 times the Debye length L_D corresponding to this insulating layer (p. 133, col. 1, lines 1 and 2).

The subject of Claim 1 is therefore not novel (PCT Art. 33(2)).

3. The novelty of Claim 1 is also [*word(s) apparently missing – translator*] by Document D2 (see in particular p. 530, col. 1, last paragraph), D3 (col. 2, lines 18-38: the thickness of the insulator film is not mentioned in this document, but since the goal is to generate an electric field in the sensitive film, it is implicit that the insulator

film is sufficiently thin to achieve this) and, if the priority of the application should not be valid, D4 (p. 356, col. 1 and p. 358, paragraph between columns 1 and 2).

4. Dependent claims 2-11 do not contain any features that, in combination with the features of any claim to which they refer, meet PCT requirements regarding novelty or inventive step. The reasons are:
 - 4.1 The additional restrictions on the thickness of the insulator film disclosed in dependent Claims 2 and 3, do not appear to bring about an unexpected effect that could support the existence of an inventive step. Hence the subject of Claims 2 and 3 is not inventive (PCT Art. 33(3)).
 - 4.2 With reference to Claim 4, a multiplicity of microstructured field electrodes is equivalent to the long sections of the meander-shaped heater element of D1.
 - 4.3 Dependent Claim 5 relates to a trivial structural change in the gas sensor according to Claim 2 (actually 4), a change which is included in the framework of the latter – something that an individual skilled in the art would normally do based on normal considerations, especially as the advantages achieved thereby can be anticipated without difficulty. Accordingly, the subject of Claim 5 is not based on any inventive step. The same objection applies to the subject of Claims 7, 8, and 10.
 - 4.4 The additional feature of Claim 6 is known from D1, as the gate electrode also serves as the heating element.
 - 4.5 The additional feature of Claim 9 is known from D1; see p. 133, col. 1, lines 1-2.
 - 4.6 The additional feature of Claim 11 is known from D1 (“SiO₂ insulation layer”).
5. The following claims do not meet the requirements of PCT Art. 6:
 - 5.1 Claim 5 cannot be dependent on Claim 2, as a plurality of microstructured field electrodes is not disclosed in Claim 2.
 - 5.2 In Claim 10, the expression “to be made” relates to the manufacturing method instead of disclosing a technical feature of the device.
 - 5.3 A desired effect is disclosed in Claim 11; the formulas in parentheses appear to be disclosed merely as examples (i.e. optional).